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मानक

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IS 8906 (1987): Ice Axe-Cum-hammer for Mountaineering [PGD
27: Mountaineering Equipment]



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“ज्ञान एक ऐसा खजाना है जो कभी चुराया नहीं जा सकता है”

Bhartrhari—Nitiśatakam

“Knowledge is such a treasure which cannot be stolen”

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Indian Standard

SPECIFICATION FOR
ICE AXE-CUM-HAMMER FOR MOUNTAINEERING

(First Revision)

- 1. Scope** — Covers the requirements for ice axe-cum-hammer for mountaineering.
- 2. Nomenclature and Dimensions** — See Fig. 1.
- 3. Material** — The various components of ice axe-cum-hammer shall be manufactured from the following materials:

Components	Material
Head and spike	Steel Grade 40 Ni3Cr65Mo55 of IS : 5517-1978 'Specification for steels for hardening and tempering (first revision)'.
Ferrule	Mild steel sheet to Type D of IS : 513-1986 'Specification for cold rolled low carbon steel sheets and strips (third revision)'.
Rivets	Conforming to IS : 2155-1982 'Specification for cold forged solid steel rivets for hot closing (6 mm to 16 mm diameter) (first revision)'.
Handle	Ash or compreg. Compreg shall conform to Grade GM Type V of IS : 3513 (Part 3)-1966 'Specification for high and medium density wood-based laminates (compreg) : Part 3 General purposes'.

4. Hardness

4.1 Head — The ice axe-cum-hammer shall be evenly hardened and tempered and shall have a hardness of 350 to 450 HV.

4.2 Spike — The spike shall be evenly hardened and tempered to hardness of 350 to 450 HV.

5. Manufacture

5.1 Head — The head including the straps shall be soundly forged in one piece. The rivet holes shall be properly countersunk to receive the rivet heads. The serrations on the pick shall be well-finished but shall not be sharp.

5.2 Spike — Spike shall be soundly forged to shape. The spike shall be forced into the taper hole at the bottom of the handle after fitting the ferrule so that the spike shall be tight fit throughout the length of shank without splitting or weakening the handle.

5.3 Ferrule — The ferrule shall be either solid drawn or brazed or welded. The larger end of the ferrule shall be reasonably flush with the handle after fittings, without weakening the handle at this point. To achieve this, under cutting of the handle may be avoided and at the broad end, the inside of the ferrule may be given small radius. The ferrule shall be tight and further secured to the handle with the screw. The ferrule shall be tight fit and shall be driven on the end of the handle before inserting the spike.

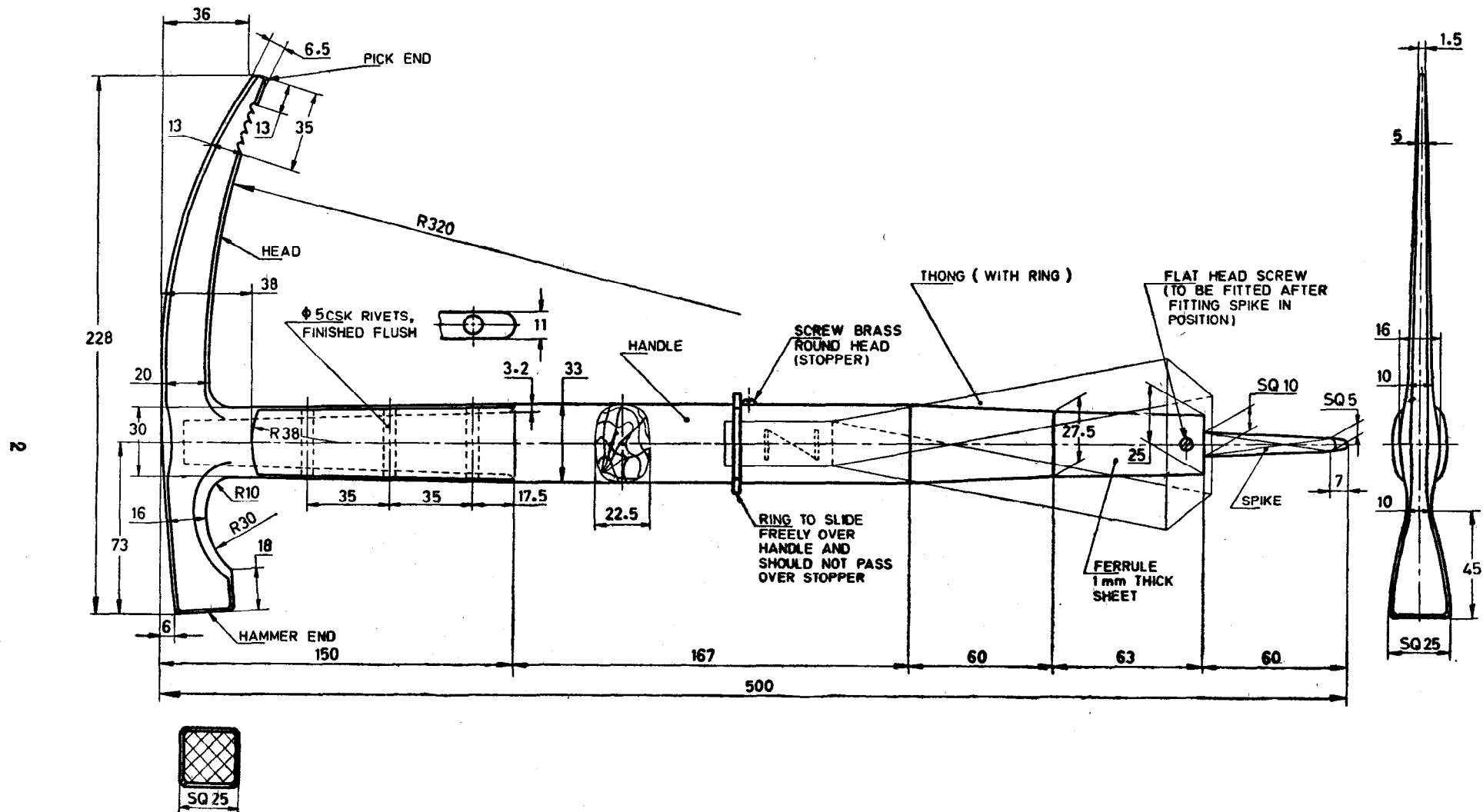
6. Handle

6.1 Timber Ash — The blank for the handle shall be quarter sawn and free from centre heart (pith), knots, shakes, curls, rot, check, rammy figures, splits, warp, brashness, insect attack, borer holes, discoloration owing to incipient decay. The timber shall have a rate of growth between 4 to 10 rings per 25 mm measured radially and the proportion of the summer wood to spring wood shall be not less

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All dimensions in millimetres.

FIG. 1 DIMENSIONS FOR ICE AXE-CUM-HAMMER FOR MOUNTAINEERING

than 50 percent. (The timber ash meeting these requirements is expected to have a density of more than 0.65 g per cubic centimetre at 15 percent moisture content.) The timber shall be straight grained and the maximum inclination of grain and fibre shall not exceed 1:20 and less than 10 percent and not more than 15 percent.

6.2 The handle shall be tightly fitted into the recess in the head. The straps of the head shall be snugly fitted and bedded down sufficient with the handle and securely riveted. Care shall be taken to ensure that the rivet holes are at right angle to the growth rings and veneers of ash and compreg handles respectively. The rivet holes shall be properly countersunk to allow flush fitting of the strap with the surface.

7. Workmanship and Finish

7.1 The head, spike and ferrule shall be free from cracks, pits, rust, flaws, seams and other defects.

7.2 The brazing or welding of the ferrule shall be even, continuous and sound.

7.3 The handle when finished to the dimensions, shall be coated at the head end and spike end with bituminous paint before further assembly.

7.4 All sharp edges shall be removed.

7.5 The head, ferrule and spike shall be finished bright. The head and spike, if made from 40Ni3Cr65Mo55 steel, shall be nickel-chrome or cadmium-plated. The nickel chrome plating shall conform to Service Grade 2 of IS : 1068-1985 'Specification for electroplated coatings of nickel plus chromium and copper plus nickel plus chromium on iron and steel (second revision)' and cadmium plating shall conform to Service Condition No. 2 of IS : 1572-1968 'Specification for electroplated coatings of cadmium on iron and steel (first revision)'. The metal components of the ice axe shall be coated with suitable grease and wrapped in waxed paper, when not in use, to protect against rust or corrosion.

8. Tests

8.1 Flaw Test — The head shall be laid flat on a steel block and struck several light blows at different places with a ball pein hammer of 500 g. The test shall be repeated for the spike also. There shall be no sign of damage or crack.

8.2 Crack Test — Each head shall be subjected to crack detection test before plating or assembly.

8.3 Beam Test — The axe shall be supported at two places, one at 40 mm from the head end and the other at 60 mm from the tip of the spike, with the major axis of the handle lying horizontally. A load of 800 N shall be applied downwards at the point midway between the supports. The load shall be gradual and shall be maintained for one minute. There shall be no sign of damage or fracture at the handle or deformation of head or spike.

8.4 Cantilever Test — The pick end shall be firmly held in a vice at a distance of 40 mm from the junction of the handle in a such a way that the handle extends over the edge of the vice but does not rest on it. A load of 300 N shall be applied gradually at the junction of the ferrule and spike and maintained for one minute. There shall be no sign of damage.

8.5 Performance Test — The axe shall be held in one hand (the holder in a standing position) just above the larger end of the ferrule and the hammer shall be struck with full force from a height of 1 m on to a mild steel plate 500×300×25 mm having a hardness 90 to 120 HV. The strike shall be such that the hammer strikes roughly perpendicular to the steel plate. This test shall be repeated 12 times for the hammer end. Similar test shall be conducted for the pick end for 12 times. The spike end shall also be struck 12 times on the same steel plate in a similar manner by holding the head. There shall be no sign of damage at the completion of the above test.

8.6 Impact Test — The test shall be carried out at head at -40°C and shall field 27 J, Min.

8.7 After completing the above tests, the axe shall be thoroughly examined for any sign of fracture or deformation or loosening or displacement of head and rivets or pick. There shall be no defects. The handle shall also show no sign of damage or fracture.

9. Marking — The ice axe-cum-hammer shall be legibly and indelibly stamped/marked with the manufacturer's name, initials or recognized trade-mark, the year of manufacture and the size of the axe.

9.1 Standard Marking — Details available with Bureau of Indian Standards.

EXPLANATORY NOTE

This standard was first published in 1978. The major changes in this revision relate to the material of head and spike and their hardness. The changes in the materials have been recommended by the Research and Development Organization, Defence Metallurgical Research Laboratory after actual investigations on the imported components received from Research and Development Establishment (Engrs) (Report No. 5/83). The requirements of mass has also been deleted. The requirements for ice axe for mountaineering have been covered separately, in IS : 8648-1987 'Specification for ice axe for mountaineering (*first revision*)'.